

WHAT IS CLAIMED IS:

1. A turbine nozzle segment comprising:

an outer band portion;

an inner band portion;

at least one nozzle vane extending between said inner band portion and said outer band portion, said at least one nozzle vane, said inner band portion, and said outer band portion defining a flowpath for flowing hot gases of combustion; and

at least one cooling channel extending axially at least partially through at least one of said outer band portion and said inner band portion, each said cooling channel comprising at least one inlet, each said inlet isolated from the flowing hot gases of combustion.
2. A turbine nozzle segment in accordance with Claim 1 wherein inner and outer band portions each comprise first and second mating side surfaces, each said mating side surface comprising a seal slot extending circumferentially into said mating surface, said at least one cooling channel located between said seal slot and said hot gas flowpath.
3. A turbine nozzle segment in accordance with Claim 2 wherein each said inlet is located in an upstream end portion of said cooling channel and is in communication with at least one of compressor discharge air and impingement cooling air from an upstream nozzle segment.
4. A turbine nozzle segment in accordance with Claim 2 wherein a downstream end portion of each said cooling channel comprising at least one exit port.
5. A turbine nozzle segment in accordance with Claim 4 wherein each said exit port is in communication with at least one of said hot gas flow path, a

mating side surface of said band portion, and a downstream cooling impingement area.

6. A turbine nozzle segment in accordance with Claim 1 wherein said cooling channel is defined by an undercut region in said band portion and a cover plate covering at least a portion of said undercut region of said band portion.

7. A turbine nozzle segment comprising:

an outer band portion having an outer surface, an inner surface, and first and second mating side surfaces;

an inner band portion having an outer surface, an inner surface, and first and second mating side surfaces;

at least one nozzle vane extending between said outer surface of said inner band portion and said inner surface of said outer band portion, said at least one nozzle vane, said outer surface of said inner band portion, and said inner surface of said outer band portion defining a flowpath for flowing hot gases of combustion; and

at least one cooling channel extending axially at least partially through at least one of said outer band portion and said inner band portion, each said cooling channel comprising at least one inlet, each said inlet isolated from the flowing hot gases of combustion.

8. A turbine nozzle segment in accordance with Claim 7 wherein said first and second mating side surfaces of said inner and said outer band portions comprising a seal slot extending circumferentially into said mating surfaces, at least one cooling channel located between at least one of said seal slot and said outer surface of said inner band portion, and said seal slot and said inner surface of said outer band portion.

9. A turbine nozzle segment in accordance with Claim 8 wherein each said inlet is located in an upstream end portion of said cooling channel and is in

communication with at least one of compressor discharge air and impingement cooling air from an upstream nozzle segment.

10. A turbine nozzle segment in accordance with Claim 8 wherein a downstream end portion of each said cooling channel comprising at least one exit port.

11. A turbine nozzle segment in accordance with Claim 10 wherein each said exit port is in communication with at least one of said hot gas flow path, a mating side surface of said band portion, and a downstream cooling impingement area.

12. A turbine nozzle segment in accordance with Claim 7 wherein said cooling channel is defined by an undercut region in said band portion and a cover plate covering at least a portion of said undercut region of said band portion.

13. A turbine nozzle segment in accordance with Claim 7 wherein said at least one cooling channel comprises a turbulator to promote turbulent air flow through said cooling channel.

14. A method of cooling mating side faces of inner and outer band portions of turbine nozzle segments, the nozzle segment comprising an outer band portion, an inner band portion, and at least one nozzle vane extending between the inner band portion and the outer band portion, the at least one nozzle vane, the inner band portion, and the outer band portion defining a flowpath for flowing hot gases of combustion, said method comprising:

flowing a cooling medium through at least one cooling channel extending axially at least partially through at least one of the outer band portion and the inner band portion, each cooling channel comprising at least one inlet, each inlet isolated from the flowing hot gases of combustion.

15. A method in accordance with Claim 14 wherein inner and outer band portions each comprise first and second mating side surfaces, each mating side

surface comprising a seal slot extending circumferentially into the mating surface, the at least one cooling channel located between the seal slot and said hot gas flowpath.

16. A method in accordance with Claim 15 wherein each said inlet is located in an upstream end portion of said cooling channel, said flowing a cooling medium through at least one cooling channel comprises flowing at least one of compressor discharge air and impingement cooling air from an upstream nozzle segment through the at least one cooling channel.

17. A method in accordance with Claim 15 wherein a downstream end portion of each said cooling channel comprising at least one exit port.

18. A method in accordance with Claim 17 wherein flowing a cooling medium through at least one cooling channel further comprises discharging the cooling medium from the at least one exit port into at least one of the hot gas flow path, a mating side surface of the band portion, and a downstream cooling impingement area.

19. A method in accordance with Claim 14 wherein the cooling channel is defined by an undercut region in the band portion and a cover plate covering at least a portion of the undercut region of the band portion.

20. A gas turbine comprising a plurality of nozzle stages, each said nozzle stage comprising a plurality of nozzle segments, each said nozzle segment comprising:

an outer band portion;

an inner band portion;

at least one nozzle vane extending between said inner band portion and said outer band portion, said at least one nozzle vane, said inner band portion, and said outer band portion defining a flowpath for flowing hot gases of combustion; and

at least one cooling channel extending axially at least partially through at least one of said outer band portion and said inner band portion, each said cooling channel comprising at least one inlet, each said inlet isolated from the flowing hot gases of combustion.

21. A gas turbine in accordance with Claim 20 wherein said inner and outer band portions each comprise first and second mating side surfaces, each said mating side surface comprising a seal slot extending circumferentially into said mating surface, said at least one cooling channel located between said seal slot and said hot gas flowpath.

22. A gas turbine in accordance with Claim 21 wherein each said inlet is located in an upstream end portion of said cooling channel and is in communication with at least one of compressor discharge air and impingement cooling air from an upstream nozzle segment.

23. A gas turbine in accordance with Claim 21 wherein a downstream end portion of each said cooling channel comprising at least one exit port.

24. A gas turbine in accordance with Claim 23 wherein each said exit port is in communication with at least one of said hot gas flow path, a mating side surface of said band portion, and a downstream cooling impingement area.

25. A gas turbine in accordance with Claim 20 wherein said cooling channel is defined by an undercut region in said band portion and a cover plate covering at least a portion of said undercut region of said band portion.